

**Translation**

**PATENT COOPERATION TREATY**

PCT/EP2003/006051



**PCT**

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 202ku06.wo	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/006051	International filing date (day/month/year) 10 June 2003 (10.06.2003)	Priority date (day/month/year) 13 June 2002 (13.06.2002)
International Patent Classification (IPC) or national classification and IPC B01D 53/86, B01J 8/04, 8/02, 19/30, 29/06		
Applicant UHDE GMBH		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

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Date of submission of the demand 08 December 2003 (08.12.2003)	Date of completion of this report 18 October 2004 (18.10.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/006051

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

☐ the international application as originally filed☒ the description:

pages \_\_\_\_\_ 1-17 \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

☒ the claims:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, as amended (together with any statement under Article 19

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_ 1-21 \_\_\_\_\_, filed with the letter of 01 September 2004 (01.09.2004)

☒ the drawings:

pages \_\_\_\_\_ 1/6-6/6 \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

☐ the sequence listing part of the description:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☐ The amendments have resulted in the cancellation of:☐ the description, pages \_\_\_\_\_☐ the claims, Nos. \_\_\_\_\_☐ the drawings, sheets/fig. \_\_\_\_\_5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-21	YES
	Claims		NO
Inventive step (IS)	Claims	15-21	YES
	Claims	1-14	NO
Industrial applicability (IA)	Claims	1-21	YES
	Claims		NO

## 2. Citations and explanations

Reference is made to the following document:

D1: WO 01/51181 A (SCHWEFER MEINHARD; SZONN ERICH  
(DE); KRUPP UHDE GMBH (DE); TUREK T) 19 July  
2001 (2001-07-19)

1. The present application does not meet the requirements of PCT Article 33(1) because the subject matter of claims 1 to 14 does not involve an inventive step within the meaning of PCT Article 33(3).

1.1 D1 discloses a method (see claims and page 7, lines 22 to 34) for reducing the NO<sub>x</sub> and N<sub>2</sub>O contents of processing gases, wherein:

- a) the gas to be treated is passed through a series of two catalyst zones I and II (can be interpreted as two mutually adjoining catalyst beds) comprising one or a plurality of iron-laden zeolites (e.g. Fe-ZSM-5);
- b) ammonia is added between the reaction zones;

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- c) the temperature in the two zones is set at a value of less than 500°C;
- d) the gas pressure is set at between 1 and 25 bar; and
- e) a spatial velocity of between 5,000 and 100,000 h<sup>-1</sup> is selected (10,000 h<sup>-1</sup> in the embodiment).

The subject matter of claim 1 differs from the disclosure in D1 in that the gas leaving the first catalyst stage contains at least 200 ppm N<sub>2</sub>O. In D1, this value is at most 200 ppm.

The "considerably increased efficiency" of the method that allegedly results from this technical difference is, however, not clear (no examples or counter examples to demonstrate the improvement with respect to D1). Nor does claim 1 mention the reaction conditions (which differ from those in D1) under which NO<sub>x</sub> reduction and N<sub>2</sub>O decomposition occur simultaneously in the second reaction stage (e.g. increased pressure: > 2 bar; see page 4, lines 1 and 2, of the description).

No inventive step within the meaning of PCT Article 33(3) can be discerned in the subject matter of claim 1.

- 1.2 It is currently not clear to what extent claims 2 to 14 contain features which, combined with the features of any claim to which they refer, meet the PCT inventive step requirements.

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2. The subject matter of claims 15 to 21 meets the requirements of PCT Article 33(1).
- 2.1 D1 discloses a device for reducing the NO<sub>x</sub> and N<sub>2</sub>O contents in gases, the device comprising two catalyst zones I and II (can be interpreted as two mutually adjacent catalyst beds) and a device arranged between the zones for introducing a gaseous reducing agent into the flow of gas to be treated.

The subject matter of claim 15 differs from the D1 device in that at least one of the catalyst beds is designed as a hollow cylinder through which the gas containing NO<sub>x</sub> and N<sub>2</sub>O flows radially.

- 2.2 The hollow-cylindrical shape of at least one of the catalyst beds combined with the radial gas passage results in a considerably reduced pressure loss and thus in simplified control of the method.
- 2.3 Claims 16 to 21 are dependent on claim 15 and also meet the requirements of PCT Article 33.
3. The two independent claims (method and device) are drafted without any reference to one another. The method as per claim 1 can obviously be carried out to comparable effect in any suitable device having two catalyst beds (e.g. D1), whatever the geometrical shape of the beds. The claims do not indicate the reason why the device as per claim 15 should be used to carry out the method as per claim 1 advantageously.

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It is furthermore unclear that the features in the independent claims distinguishing the subject matter from the prior art (D1) are identical and the problems to be solved in the two claims are identical.

Therefore, in their current version, claims 1 and 15 formally contravene PCT Rule 13.1, i.e. (formally) they do not meet the unity of invention requirement.

This situation could be remedied by an explicit reference to the device as per claim 15 in the claim that is directed to the method.

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